Report By:

National TAB
1329 E. KEMPER ROAD
SUITE 4210
CINCINNATI, OH 45246

Report: TAB Report

Function: Test, Adjust, & Balance

Date: 11/26/2025

Completed By: National TAB

PROJECT

12-08-25 QT #1439 MESA, AZ

9038 E. ELLIOT RD

MESA, AZ

Client

QUIKTRIP

4705 SOUTH 129TH EAST AVENUE

TULSA, OK 74134

National TAB

Project: 12-08-25 QT #1439 MESA, AZ

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Project Summary

Project Summary
The summary below provides a quick understanding of our scope of work and general testing procedures. Enclosed in the report are further details about your building performance including recommendations, asset data, and pictures. Our focus is to work with the trades to remedy any issues or deficiencies during the actual field balancing and not after the balancing has occurred to achieve a positive environment and outcome. The level of success is determined by the availability of the trades, possible parts needed, or time constraints.

RTU's (Roof Top Units)
Each of the RTU's was measured with a flow hood to establish total flow. The total flow was then adjusted via the VFD so that airflow fell within design tolerances. All diffusers on the kitchen RTU were balanced to the engineer's design flow. The diffusers on the sales floor were only adjusted when there were noticeable issues present like drafting or dampers that were found completely closed. The Hoods On outside air rate was set by first establishing the typical QT set point at the Emerson controller and then making manually adjustments on the roof. The hoods off airflow setpoint was found by adjusting the damper position at the Emerson controller until the design airflow was achieved. Outside air was measured by reading the intake air opening with a velocity grid and multiplying by the free area. After completion of TAB all overrides were released.

Kitchen Exhaust Hood & Associated Fans
The kitchen exhaust fan was measured at the hood filter bay utilizing a velocity matrix and a manufacturer's correction factor. Each filter velocity is multiplied by the manufacturer's corrected area. The sum of these readings equals the total flow of the exhaust fans. The total flow of the exhaust was then adjusted to within tolerance of the design flow.

Restroom Exhaust Fans
The restroom exhaust fans were measured with a flow hood. The total flow was balanced for the fan with the exception of the new grille over the combi-oven, which was balanced to the listed design.

Final Building Tests
After completing the test and balance the final building pressure was measured. It was confirmed that the building pressure fell within acceptable tolerances and that the pressure measurement coincides with the actual and design net airflow. Any deviations from these standards are noted throughout the report. The hood capture was tested at the perimeter of the hood and the cook top level with the equipment heat on to ensure satisfactory hood capture and containment.

Issue List

- DAMPERS INACCESSIBLE
- EXHAUST FAN INSTALLATION
- HOOD FAILED SMOKE TEST AT MAX
- MSC NOT PROPERLY INSTALLED
- RTU-2 SUPPLY GRILLE INACCESSIBLE

Project Issue Information

Issue Name : DAMPERS INACCESSIBLE

Description : RTU3 dampers should be accessible for TAB. Unable to access dampers and unable to balance kitchen diffusers as result. Tiles cannot be move due to proximity of light canisters to steel beams and the hood. They are installed too far in to be reached on either side of row of lights. Recommend not installing tiles until kitchen has been balanced.

Created By :	National TAB	**Assigned To :**	National TAB - Dan Hertenstein
Status :	Open		
Priority :	High	**Asset Tag :**	RT-3
Originated Date :	12/10/2025 - Christine Weale - National TAB		

Project Issue File Details

12/10/2025

12-08-25 QT #1439 MESA, AZ

Project Issue Information

Issue Name : EXHAUST FAN INSTALLATION

Description : Fan cannot be tilted all the way back, blocked by grease cup. Hinge should be opposite of grease cup. Additionally, electrical conduit is routed up through the curb to the fan and may also inhibit the fan from tilting back for cleaning. Recommend this is corrected.

Created By :	National TAB	**Assigned To :**	National TAB - Dan Hertenstein
Status :	Open		
Priority :	Medium	**Asset Tag :**	EF3
Originated Date :	12/10/2025 - Christine Weale - National TAB		

Project Issue File Details

12/10/2025

12-08-25 QT #1439 MESA, AZ

Project Issue Information

Issue Name : HOOD FAILED SMOKE TEST AT MAX

Description : Grilles were adjusted, hood exhaust turned up to +8-10% over design (max allowed), smoke test still failed. Smoke escapes mostly from panel side(left), and a small amount from right-front.

Created By :	National TAB	**Assigned To :**	National TAB - Dan Hertenstein
Status :	Open		
Priority :	Urgent	**Asset Tag :**	HD1
Originated Date :	12/10/2025 - Christine Weale - National TAB		

Project Issue File Details

1. Open 20251209_142224_990531249.mp4
   12/10/2025

12-08-25 QT #1439 MESA, AZ

Project Issue Information

Issue Name : MSC NOT PROPERLY INSTALLED

Description : Installer did not screw the cover for the MSC on, there were no spare screws of a correct size.

Created By :	National TAB	**Assigned To :**	National TAB - Dan Hertenstein
Status :	Open		
Priority :	InfoOnly	**Asset Tag :**	EF3
Originated Date :	12/10/2025 - Christine Weale - National TAB		

Project Issue File Details

12/10/2025

12-08-25 QT #1439 MESA, AZ

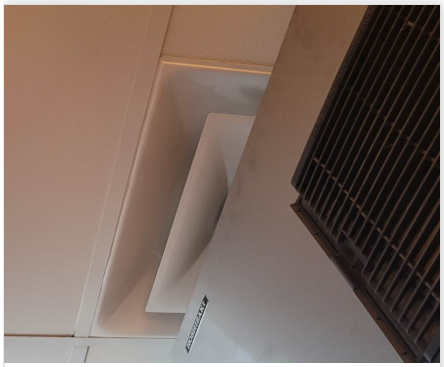
Project Issue Information

Issue Name : RTU-2 SUPPLY GRILLE INACCESSIBLE

Description : RTU2-5 grille is in the wrong place and is inaccessible. Damper was closed, after I measured for total flow I opened it so the back area would be conditioned. Equipment is largely blocking airflow, however.

Created By :	National TAB	**Assigned To :**	National TAB - Dan Hertenstein
Status :	Open		
Priority :	InfoOnly	**Asset Tag :**	SGRD5
Originated Date :	12/10/2025 - Christine Weale - National TAB		

Project Issue File Details



12/10/2025

NATIONAL TAB

AIR BALANCE SCHEDULE

UNIT	AREA SERVED	HOOD ON OA		HOOD OFF OA		HOOD ON EXHAUST		HOOD OFF EXHAUST	
		DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL	DESIGN	ACTUAL
RTU 1	SALES	800	820	350	364				
RTU-2	SALES	800	834	350	385				
RTU-3	BOH/KITCHEN	800	866	350	369				
EF-1	RR/JANITOR					750	802	750	802
EF-2	COMBI-OVEN					150	267	150	267
EF-3	HOOD					1350	1460	0	0
TOTALS		2400	2520	1050	1118	2250	2529	900	1069

HOODS ON

NET AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	2400	2520
TOTAL EXHAUST	2250	2529
NET AIRFLOW	150	-9

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS
FRONT	0.002
SIDE	0.001
REAR	
AVERAGE	**0.0015**

HOODS OFF

NET AIRFLOW CALCULATION

TOTALS	DESIGN	ACTUAL
TOTAL OA	1050	1118
TOTAL EXHAUST	900	1069
NET AIRFLOW	150	49

DOOR TESTED	BUILDING PRESSURE MEASUREMENTS
FRONT	0.004
SIDE	0.003
REAR	
AVERAGE	**0.0035**

NOTES:

Building is barely neutral w/ Hood On. Recommend fixing exhaust design so hood fan can be turned back down to design (instead of ~10% over), and installing combi-oven exhaust with TAB present so it can be properly balanced - or make the exhaust accessible in some other way. OA left on 'high side' to make-up for higher exhaust. Rear door air curtain could not be shut off as usual without

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CheckList List

- 01: RTU’s/AHU’s
- 02: Exhaust Fans
- 03: Hoods
- 04: Final Tests

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CheckList Information

Name :	01: RTU’s/AHU’s	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	11/26/2025 - Trinity Dodds - National TAB		
Completed Date :	12/10/2025 - Christine Weale - National TAB		

CheckList Item Details

RTU's/AHU's

Evaporator coils are clean?	Pass
Comment:	
Condenser coils are clean?	Pass
Comment:	
Gas piping is installed and valves are turned on?	Pass
Comment:	
Unit free of noticeable noise and vibration	Pass
Comment:	

12-08-25 QT #1439 MESA, AZ

CheckList Information

Name :	02: Exhaust Fans	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	11/26/2025 - Trinity Dodds - National TAB		
Completed Date :	12/10/2025 - Christine Weale - National TAB		

CheckList Item Details

EF's

Hinge kit installed installed on hood fan?	Pass
Comment: Yes, but it's not opposite grease cup. Needs to be fixed.	
Flex conduit is long enough so that fan can be completely tilted back?	Pass
Comment: Flex isn't what's keeping it from being tilted back.	
No major leakage around the fan base	Pass
Comment:	
Unit is free of noise and vibration	Pass
Comment:	

12-08-25 QT #1439 MESA, AZ

CheckList Information

Name :	03: Hoods	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	11/26/2025 - Trinity Dodds - National TAB		
Completed Date :	12/10/2025 - Christine Weale - National TAB		

CheckList Item Details

HOODS

Hood is free of alarms?	Pass
Comment:	
Yes, but there was an intermittent 'Modbus failure' when I had to make changes on the HMI. It didn't persist, but should be noted.	
Hood is free of damage?	Pass
Comment:	
End panels are installed per prototype?	Pass
Comment:	

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CheckList Information

Name :	04: Final Tests	**Status :**	Completed
Assigned Organization :	National TAB	**Asset :**	
Requesting Organization :	National TAB		
Created Date :	11/26/2025 - Trinity Dodds - National TAB		
Completed Date :	12/10/2025 - Christine Weale - National TAB		

CheckList Item Details

FINAL CHECKS

HOOD CAPTURE TEST

List kitchen equipment turned on for testing

Comment:

All equipment was on at test time and in use.

List smoke candle type used

Comment:

45s S102

Smoke test capture % - Perimeter of hood

Comment:

80

Smoke test capture % - Top of cooking surface

Comment:

85

WITNESS

Date test was completed	12/09/2025

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Comment:

Many witnesses present, video captured.

TAB tech name / Firm

Comment:

Christine Weale, NTI

Site super name / Firm

Comment:

Owner representative name / Firm (if Applicable)

Comment:

BUILDING PRESSURE

Do actual net building airflow, design net building airflow, and pressure coincide? If not why? (All three should either be positive or negative)	Pass

Comment:

Yes, but building is barely neutral with Hood On, see Balance Schedule note.

National TAB

Project: 12-08-25 QT #1439 MESA, AZ

System/Unit: AHU/RTU

Asset: RT-1 AREA:SALES FLOOR

Unit Data	
	Actual
MFG	AAON
Serial Num	202406-ANEK30964
Model Num	RN-013-8-1-HA0A-152
Num OA Filters 1	1
OA Filter Size 1	45X22
Num Final Filter 1	2
Final Filter Size 1	46X19.5X2

Motor Data	
	Actual
Motor MFG	NL
Frame	NL
Horsepower	3.0
Motor Rpm	1760
Phase	3
Rated Voltage	208
Rated Amperage	10.6

Test Data		
	Design	**Actual**
SF CFM	4200	4421
SF RPM	-	50.4 HZ
OA CFM (Hoods On)	800	820
OA CFM (Hoods Off)	350	364
RL Voltage	-	185.2
RL Amperage	-	8.45
VFD Max SetPt	-	84
VFD Min SetPt	-	24
OA Damper Position (Hoods On)	-	46.0
OA Damper Position (Hoods Off)	-	0.0

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.57"
Fan Suction SP	-	-0.81"
Fan Discharge SP	-	0.65"
Total ESP	-	1.22"
Fan Total SP	-	1.46"

General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	YES
Condensate Drain Installed	YES

Completed By: Christine Weale on 12/10/2025

Notes:
WOMEN'S BATHROOM AIRFLOW EXTREMELY LOW. HVAC SHOULD LOOK INTO CAUSE. DAMPER INACCESSIBLE DUE TO SHELVES.
UNIT PRESSURES ARE PRETTY HIGH, SOME REGISTERS READ LOW, AND UNITS ARE RUNNING AT MAX - RECOMMEND HVAC CHECK ALL DAMPERS/DUCT FOR RTU1&2.

Written By: Christine Weale on 12/10/2025

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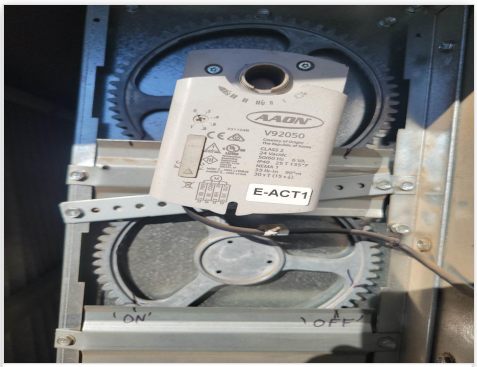
Unit Data - PHOTO LOG



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National TAB

Project: 12-08-25 QT #1439 MESA, AZ

System/Unit: AHU/RTU

Asset: RT-2 AREA:SALES FLOOR

Unit Data	
	Actual
MFG	AAON
Serial Num	202406-ANEK30962
Model Num	RN-013-8-0-HA0A-152
Num OA Filters 1	1
OA Filter Size 1	45X22
Num Final Filter 1	2
Final Filter Size 1	46X19.5

Motor Data	
	Actual
Motor MFG	NL
Frame	NL
Horsepower	3.0
Motor Rpm	1760
Phase	3
Rated Voltage	208
Rated Amperage	10.6

Test Data		
	Design	**Actual**
SF CFM	4200	4212
SF RPM	-	49.2 HZ
OA CFM (Hoods On)	800	834
OA CFM (Hoods Off)	350	385
RL Voltage	-	178
RL Amperage	-	8.47
VFD Max SetPt	-	82
VFD Min SetPt	-	24
OA Damper Position (Hoods On)	-	46.0
OA Damper Position (Hoods Off)	-	0.0

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.49"
Fan Suction SP	-	-0.71"
Fan Discharge SP	-	0.86"
Total ESP	-	1.35"
Fan Total SP	-	1.57"

General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	YES
Condensate Drain Installed	YES

Completed By: Christine Weale on 12/10/2025

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Unit Data - PHOTO LOG

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National TAB

Project: 12-08-25 QT #1439 MESA, AZ

System/Unit: AHU/RTU

Asset: RT-3 AREA:BOH/KITCHEN

Unit Data	
	Actual
MFG	AAON
Serial Num	202406-ANEK30963
Model Num	RN-013-8-0-HA0A-152
Num OA Filters 1	1
OA Filter Size 1	45X22
Num Final Filter 1	2
Final Filter Size 1	46X19.5

Motor Data	
	Actual
Motor MFG	NL
Frame	NL
Horsepower	3.0
Motor Rpm	1760
Phase	3
Rated Voltage	208
Rated Amperage	10.6

Test Data		
	Design	**Actual**
SF CFM	4200	4335
SF RPM	-	49.8 HZ
OA CFM (Hoods On)	800	866
OA CFM (Hoods Off)	350	369
RL Voltage	-	181
RL Amperage	-	8.23
VFD Max SetPt	-	83
VFD Min SetPt	-	24
OA Damper Position (Hoods On)	-	46.0
OA Damper Position (Hoods Off)	-	0.0

Performance Data		
	Design	**Actual**
MA Plenum SP	-	-0.63"
Fan Suction SP	-	-0.89"
Fan Discharge SP	-	0.37"
Total ESP	-	1.00"
Fan Total SP	-	1.26"

General	
	Actual
Fan Rotation Correct	YES
Unit Filters Clean	YES
Condensate Drain Installed	YES

Completed By: Christine Weale on 12/10/2025

Notes:
DAMPERS INACCESSIBLE, SEE REMARKS.

Written By: Christine Weale on 12/10/2025

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Unit Data - PHOTO LOG

12/10/2025

National TAB

Project:12-08-25 QT #1439 MESA, AZ

AHU/RTU

Diffuser Supply (GRD)

RT-3/BOH/KITCHEN

Asset									
Asset Name	**Location**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
SGRD1	SUPPORT SERVICE	SI	12"	800	1	632	632	632	79.0
SGRD2	SUPPORT SERVICE	SI	12"	800	1	870	870	870	108.8
SGRD3	SUPPORT SERVICE	SI	12"	800	1	875	875	875	109.4
SGRD4	SUPPORT SERVICE	SI	12"	800	1	777	777	777	97.1
SGRD5	DOCK	ES	10"	500	1	600	600	600	120.0
SGRD6	WORKROOM	ES	10"	500	1	581	581	581	116.2
Total				4200		4335	4335	4335	103.21%

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Project: 12-08-25 QT #1439 MESA, AZ

System/Unit: FAN - Exhaust

Asset: EF1 AREA:RR/JANITOR

Unit Data		
	Design	**Actual**
MFG	NA	CAPTIVEAIRE
Model Num	NA	DR50HFA
Serial Num	-	6771541
Type	-	DOWNBLAST
Configuration	-	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	HSSA
Frame	-	48Y
Horsepower	0.5	0.75
Motor Rpm	1625	1625
Phase	1	1
Voltage (rated)	115	115
Amperage (rated)	-	8.4
Service Factor	-	1.0

Test Data		
	Design	**Actual**
CFM	750	802
Fan RPM	-	N/A
Fan Rotation	-	CCW
Motor RPM	-	N/A
System SetPt	-	LOW
RL Voltage	-	N/A
RL Amperage	-	8.35
Total ESP	-	0.27"
Fan Inlet SP	-	-0.27"
Fan Discharge SP	-	ATMS

Completed By: Christine Weale on 12/09/2025

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Unit Data - PHOTO LOG

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Project: 12-08-25 QT #1439 MESA, AZ

System/Unit: FAN - Exhaust

Asset: EF2 AREA:COMBI-OVEN

Unit Data	
	Actual
MFG	N/A
Model Num	N/A

Test Data		
	Design	**Actual**
CFM	150	267

Completed By: Christine Weale on 12/09/2025

Notes:
EXHAUST FAN IN CEILING, INACCESSIBLE DUE TO COMBI-OVEN, REQUESTED INFO NOT GIVEN.

Written By: Christine Weale on 12/09/2025

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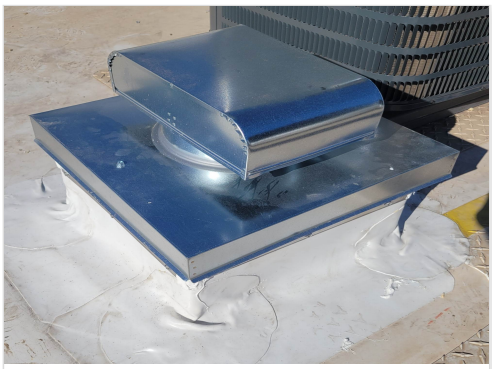
Unit Data - PHOTO LOG



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Project:12-08-25 QT #1439 MESA, AZ

FAN - Exhaust

Diffuser Ret/Exh (GRD)

EF2/COMBI-OVEN

Asset										
Asset Name	**Model Num**	**MFG**	**Type**	**Size**	**DESIGN CFM**	**AK**	**CFM(1)**	**CFM(2)**	**FINAL CFM**	**% to design**
EGRD1	N/A	N/A			150	1	267	267	267	178.0
Total					150		267	267	267	178%

Completed By: Michael McDonnell on 12/10/2025

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Project: 12-08-25 QT #1439 MESA, AZ

System/Unit: FAN - Exhaust

Asset: EF3 AREA:KITCHEN HD

Unit Data		
	Design	**Actual**
MFG	NA	CAPTIVEAIRE
Model Num	NA	DU50HFA
Serial Num	-	8181195
Type	UPBLAST	UPBLAST
Configuration	VERTICAL	VERTICAL

Motor Data		
	Design	**Actual**
Motor MFG	-	NEMA
Frame	-	NL
Horsepower	1/2	0.5
Motor Rpm	-	1800
Phase	-	1
Voltage (rated)	-	208
Amperage (rated)	-	3.8
Service Factor	-	NL

Test Data		
	Design	**Actual**
CFM	1350	1460
Fan RPM	-	1290
Fan Rotation	-	CCW
Motor RPM	-	1290
System SetPt	-	54.6 HZ
RL Voltage	-	217.5
RL Amperage	-	2.07
Total ESP	-	0.57"
Fan Inlet SP	-	-0.57"
Fan Discharge SP	-	ATMS

Completed By: Christine Weale on 12/09/2025

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Unit Data - PHOTO LOG

12/10/2025

National TAB

Project: 12-08-25 QT #1439 MESA, AZ

System/Unit: Kitchen Hood Type I

Asset: HD1 AREA:GRIDDLE

Unit Data		
	Design	**Actual**
MFG	CAPTIVEAIRE	CAPTIVEAIRE
Model Num	6030ND-2-F	6030ND-2-F
Job / Serial Num	-	8181195
Type	-	TYPE II CANOPY
Hood length	-	108"
Hood Width	-	60"

Test Data Exhaust		
	Design	**Actual**
Filter Type	-	CAPTRATE SOLO
Filter Size 1	-	16X16
Filter Qty 1	-	6
Filter AK factor size 1	-	2.08
Filter Total AK Area	-	12.48
Filter1 FPM	-	125
Filter2 FPM	-	125
Filter3 FPM	-	120
Filter4 FPM	-	111
Filter5 FPM	-	108
Filter6 FPM	-	115
Filter Ave FPM(corr)	-	117
CFM	1350	1460

Cooking Equipment	
	Actual
Item 1	FRYERS
Item 2	DUAL-OVEN

Completed By: Christine Weale on 12/09/2025

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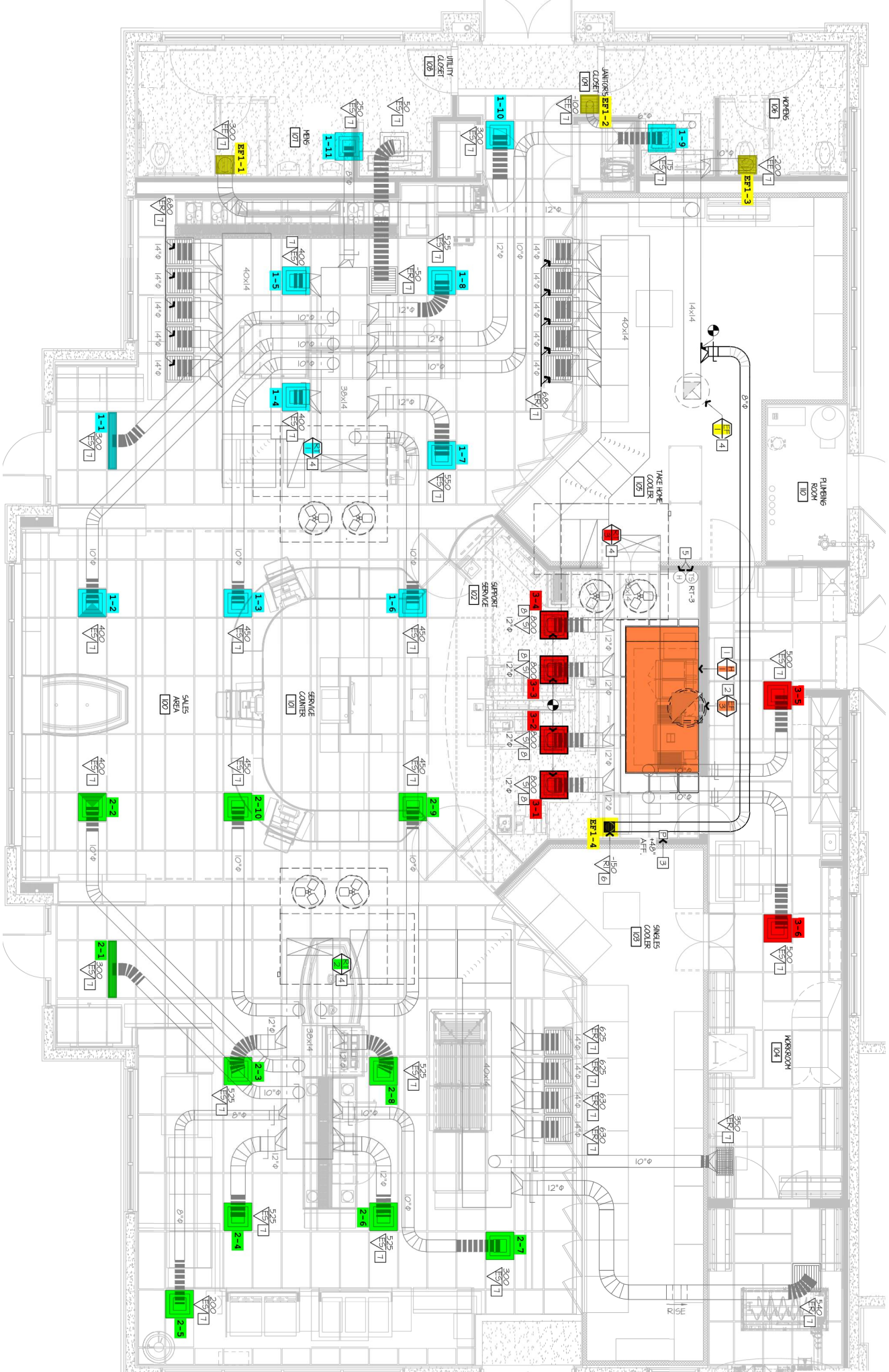

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